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Celebrity vs. Product: A Neuroscientific Approach to the Distractors in Food Advertising for Sustainable Marketing

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Abstract: Celebrity endorsement is nowadays a frequently used technique in marketing and advertising. On the one hand, celebrities have the ability to attract attention towards the advertising while on the other hand, their behavior is imitated by consumers, having a greater impact on buying decisions. One of the main challenges in advertising endorsed by celebrities is the overshadowing effect, by which consumers tend to watch the celebrity and not necessarily the advertised product. In three eye tracking experiments, we investigated the attention of consumers towards advertising with celebrities. The results showed that the celebrity was the eye-catcher of the advertising, being the first and longest object watched, but at the same time the product or the logo was also watched. The results also showed that the number of objects in advertising influenced the attention of the consumer. Across the three studies, we manipulated the number of objects and the results showed that in the case of information overload, the participants tended to watch the most familiar elements, which in our case were the celebrities. Therefore, the design and the number of objects in advertising endorsed by celebrities are also important in having a significant impact on the consumer.

Keywords: celebrity endorsement; celebrity; consumer; eye tracking; attention; overshadowing effect; neuromarketing; information overload

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1. Introduction

Celebrity endorsement is a real phenomenon nowadays as many companies, in order to attract the attention of the consumer, invest a lot in advertising featuring famous persons. Celebrities have been included in advertising campaigns in order to advertise products, services, and brands. In recent years, with the rise of the internet and social media, celebrity endorsement has become even more important as a communication channel for interaction with consumers [1]. Research regarding celebrity endorsement has mainly been conducted to measure the credibility of the endorsed celebrity [2,3], the familiarity of the promoted brand or company, the effectiveness of the campaign [1], and the match-up effect between the celebrity and endorsed brand [4,5]. The positive impact celebrities have on the attention of consumers towards advertising is another essential topic, but there are several authors who point out the risks of it. Celebrities might attract the attention of the consumer towards the advertising, but at the same time, they can distract the attention away from the advertised product [6]. So, the consumer knows the advertising campaign, but does not know which product or brand was advertised. This phenomenon is known as the 'overshadowing effect' or 'vampire effect' [6]. The results of the study conducted by [6] show that the overshadowing effect exists mainly if there is no congruency between the celebrity and the endorsed brand.

Based on this overshadowing effect, in our research, we aimed to analyze from a neuroscientific perspective how the presence of a celebrity affects the attention of the consumer

towards an advertised product. Across three eye tracking experiments, we measured the impact of the celebrity on the attention of the consumer. Previous eye tracking experiments show that the presence of the celebrity impacts the time spent on certain advertising, but not necessarily the attention to the advertised brand [7]. The type of celebrity (more or less famous) impacts the attention of the consumer towards the advertised product or brand in different contexts [7,8]. Eye tracking studies also confirm that the match-up effect between the celebrity and the brand positively impact the intention to buy the advertised product [8].

Our study strives to expand the existing literature on the neuroscientific impact of celebrity endorsement in advertising by adding the context of beverage advertising. Across three eye tracking studies, we measured the impact of the celebrity on the attention of the consumer. By measuring the total fixation time and entry times, we determined the most attractive object in the advertising by focusing on the attention towards the celebrity and the product. As shown before, celebrity endorsement advertising impacts the attention of the consumer and their intention to buy, only if it is properly designed. Analyzing different pictures of the same advertising allowed us to determine key features for effective celebrity advertising design. In our research, we used advertising for beverages. Celebrity endorsement in food advertising may have an important influence on the eating habits of individuals and especially children [9,10]. Celebrities advertising unhealthy food products may influence individuals to consume such products, which is not sustainable in the long run. Studying the impact that celebrities have on food advertising is an important topic for influencing the eating habits of the population and thus sustainable, health-oriented consumption [10,11].

2. Literature Review

2.1. Celebrity Endorsement as a Communication Tool

Celebrity endorsement is a well-known marketing approach that allows businesses to capitalize on the celebrity of their testimonials to help sell their products [12]. Celebrity brand ambassadors are arguably the most frequently used, powerful correspondence in the advertising world [13]. Many of their sponsors—advertisers, firms, organizations, and marketers—use them as a persuasive communication tool to influence or persuade their target audiences to acquire their products and services [14]. As persuasive communication methods, public relations and advertising have a lot in common [15]. Testimonials are important for a brand's image and marketing strategy. Celebrities have a big influence on customers as a reference group because they provide a good example for them. Consumers often emulate and crave their glamorous and luxurious lifestyle, as well as the products they wear and the cosmetics they use [9,16]. As a result, the things they advertise are frequently purchased by consumers. Consequently, using celebrity brand ambassadors in product or service advertising is critical to the success of any marketing campaign [17]. Usually, endorsers that are widely known to the public are a greater hit than testimonials from non-celebrities, which do not have massive notoriety. Endorsers give the consumers a sensation of reliability, emphatically influencing their purchase decision [18]. According to [19], celebrity trustworthiness influences consumers' purchase decisions, making it crucial to marketers and advertisers. Another crucial factor is selecting the proper celebrity brand spokesperson. An endorser should be a calm individual who has not been involved in any scandals or legal issues, as these factors reduce consumers' trust in them [20]. When the public learns of a celebrity's involvement in a scandal, the image of the sponsored product suffers. It is also important to analyze the celebrity's compatibility with the promoted goods; this principle is just as fundamental as the rest [21]. The suitability of a testimonial and the advertised brand may be the key to a successful advertising campaign [22]. As a result, a corporation must carefully and strategically select the endorser of its items. A definition given by [5] describes a 'celebrity endorser' as an individual who enjoys public recognition and uses it in order to promote a product, by appearing in its advertising and communication campaigns. As a result, 'testimonial endorsement' refers to a marketing communication instrument in which a person uses his or her public notoriety and awareness to advertise

the use or sale of a service, product, or brand [5]. Other authors defined a 'celebrity' as a person who enjoys a high social reputation or public recognition. This includes movie stars, artists, singers, sportsmen, and other people familiar to the public who are successful in their fields of activity and receive media attention for it [23]. Celebrity endorsements are a popular way to improve marketing communications [16]. In fact, celebrity status can come from a multitude of places, including film acting, music, and athletic achievement, to name a few examples. Although athletes have endorsed brands, the effectiveness of these advertisements has not always been as good as predicted. Many people believe that having experience with a product that is relevant to athletic performance might help a person fit in better with the endorsed product. In other words, consumers are more likely to see a fit between a sportsman and a sport brand than between an athlete and a non-sport brand [24]. Companies are preoccupied with celebrity endorsements, yet celebrity associations may not always enhance the brand [25], and a thorough understanding of the processes behind the impact of their expertise remains a major research focus. As the 'match-up effect' indicates, the intrinsic similarity or consistency between celebrities and products increases the effectiveness of the endorsement. The match should reflect the brand's key traits as well as the celebrity's unique characteristics [2]. Expertise is commonly regarded as a crucial feature for generating the fit between an endorser and a brand, according to some classical marketing research [26]. Consumers are constantly exposed to hundreds of brief advertisements in one form or another in advertising, ranging from web ads to TV commercials, and other information. The effectiveness and acceptance of brands are affected by how fast they perceive endorser competence and how they match up with brands. According to a previous study, celebrities represent ideal role models for most customers, and many people like learning, reading, and keeping up with celebrities' lifestyles [27]. As a result of the connotations for their aspirational reference groups, celebrities are successful endorsers [28]. Past research indicates that celebrity endorsement is an effective approach to increasing buying intentions and behavior. Consumers' susceptibility to celebrity signals is particularly strong for product categories with substantial social and psychological risks, and for product categories including factors such as discriminating taste, other people's opinions, and self-image [4]. Furthermore, there is a lot of evidence that the attributes of the celebrity endorser have an impact on the effectiveness of the endorsement. In terms of attitudes, intentions, and market-based outcomes, the literature on celebrity endorsements has ample evidence that the proper use of a celebrity endorser is effective in promoting a product and getting the right response from consumers [29]. The key research streams within the phenomenon of celebrity endorsement are the credibility stream, the congruence stream, and the meaning transmission stream. According to 'source credibility' experts, the celebrity endorser's perceived credibility is the explanation for the endorser's impact on customers. Attractiveness, trustworthiness, and expertise are three characteristics of source credibility by which an endorser might influence consumers [30]. According to celebrity endorsement researchers, each of these aspects has a beneficial effect on customer attitudes and behavior, such as trustworthiness, knowledge, and beauty [31]. 'Congruence' studies are based on the concept of a celebrity–brand congruence-fit and they explain the effectiveness of endorsements by looking at how well the celebrity and the brand 'match'. While the concept of congruence was initially limited to the celebrity–product, subsequent research has investigated other aspects of endorsement congruence, including personality, target audience age, and country of origin [32,33]. The 'meaning transfer model', which is based on McCracken's (1989) definition of 'celebrity endorsements' [5] as a meaning transfer process, is the third stream of research in celebrity endorsements. He suggested the concept by which celebrities are viewed as a repository of meaning that is transferred to a product brand through advertisements and social processes. These meanings are then consumed by customers through the possession and consumption of commodities and services. In comparison to the other two streams, researchers have focused less on 'meaning transfer', and have investigated celebrity qualities as a proxy for meaning, finding that the same is transferred to the endorsed item [34]. A more attractive celebrity effectively

conveys the message of the endorsed brand [26]. The term, 'attractiveness', can apply to physical aspects as well as other traits such as intelligence or lifestyle [35], all of which can influence purchase intentions, brand memory, and attitudes toward the brand [26,36]. Consumer credibility appears to be a key component of celebrity credibility and it consists of several factors (e.g., attractiveness, dynamism, and objectivity). However, there is a universal agreement that the characteristics of knowledge and trustworthiness are the most important [30]. The source's honesty and the objectivity of the information supplied are measured by trustworthiness. A consumer's evaluation of a celebrity's knowledge and the credibility of his or her recommendations is known as 'expertise'. Many indices of advertisement effectiveness, such as brand, product, and advertising attitudes, as well as buying intentions, are influenced by a celebrity's credibility. Some research, however, points out that attractiveness and credibility have limited effects on consumer attitudes and that these models are not uniformly relevant to all products [37]. Congruency models, also known as fit, match-up, coherence, or similarity models, are a more integrative method that aims to address these limitations. This strategy recognizes that most endorsements aim for a balance between the brand and the testimonials. That is, managers often strive to ensure that the brand is compatible with the image projected by the endorser, which can lower perceived risk while also encouraging good consumer views. A congruent recommendation should be more effective (in accordance with the match-up effect), whereas the absence of congruency may signal that the celebrity is recommending the brand primarily for financial reasons, which could lead to negative feedback [38]. Such endorsement models frequently place a premium on celebrity qualities (attractiveness, credibility) or brand closeness, leaving the consumer as a bystander. However, studies in a variety of scenarios that include consumers, brands, and a third influential entity (e.g., another brand, a social cause, etc.) support the idea that customers always play an active role. A co-branding study, for example, identifies three congruencies that influence the perceptions of brand alliances: between the brand and the consumer, the consumer and the partner, and the brand and its partner [39]. Both cause–consumer and brand–consumer congruencies influence the consumer's preference for a cause-supporting brand in cause-related marketing scenarios. However, there is no such triadic framework in the endorsement literature. Few consumer-based researchers rely heavily on the balancing theory to support their claims. Researchers have studied the strength of the relationship between source credibility and other dimensions in celebrity endorsement, considering the growing trend of publications in this field. When celebrity credibility is combined with variables such as the celebrity effect and celebrity–brand fit, the impact of celebrity credibility is amplified [2]. Furthermore, [40] one must evaluate the fundamental theories and credibility traits in a strategic framework, and correlate them with brand value propositions. Other review publications have not gone into detail about the topic. Consumers desire balance and harmony in the elements that surround them [41]. Their perceptions of a celebrity-endorsed brand are thus influenced not just by the celebrity–brand association, but also by the consumers' personal relationships with the two. However, because customers have more complex relationships with companies, opinions alone may not be enough to predict their overall behavior. A good or negative attitude toward a brand is referred to as a 'brand attitude'. A consumer's willingness to engage in tough activities that benefit the brand is referred to as 'behavioral intention'. Finally, 'brand commitment' refers to a customer's desire to keep a relationship with a company [42]. Consumer brand passion has been shown through linking brand-related characteristics such as brand trust, brand identity, actual/ideal self-congruence, brand quality, brand personality, and brand experience in much of marketing scholars' research on passion [43]. The meaning transfer model has been outlined, and researchers claim that well-liked and attractive endorsers are more efficient at transferring meaning to a brand, generating a distinct personality for the endorsed brand, and enhancing an immediate brand identity or person.

Consumer behavior and attitudes are influenced by celebrity endorsement. However, these effects vary depending on the product category. In other words, in addition to

endorser-specific criteria, the product category is an essential factor in the celebrity's influence on customer behavior [4]. Products with low-involvement buying decisions that are purchased by routine decision-making are effectively advocated by likeable celebrities who recommend them [44]. Furthermore, food and beverage corporations frequently employ athlete endorsements to encourage the consumption of food products, particularly among children and young people [45,46]. New research demonstrates that the sight of a celebrity advocating food goods on social media sites such as Instagram has a higher impact on customer behavior than any other form of endorser [47]. In general, celebrity endorsement increases consumer engagement [48] and in the case of the food industry, they can influence consumers to pay a premium price for food products [49]. There is also a negative side to the influence of celebrities on food consumption. Several studies have shown that celebrities endorsing unhealthy food advertising may influence the eating habits of children, leading to obesity and eating disorders [10,11].

2.2. Neuromarketing and Its Impact on Consumer Behavior

Neuromarketing aims to illustrate what happens in people's brains in response to certain stimuli related to products, brands, or advertising, in order to determine strategies that lead to the purchase of products and services [50]. Neuromarketing research makes it possible, in addition to identifying the emotions generated by the marketing message or product used, to establish correlations between those emotions and the specific elements of the message or product characteristics that generated those emotions and attracted the attention [51]. Neuromarketing is the technique of investigating why individuals buy different products or services based on the activation of different areas of the human brain [52]. It is an interdisciplinary, relatively new, and controversial field of research, a component part of marketing, through which psychological and neuropsychological knowledge needs to be analyzed to properly understand customer behavior [53]. While traditional behavioral research methods and techniques focus on the visible stimuli that determine a particular buying or consumption behavior, neuromarketing research enhances the possibility of approaching the invisible side, that of neural connections [54], which are carried out at the brain level, contributing to the depth of market research and its significant refinement. The visual aspect of products is an important factor in the buying decision [55], also having implications on other fields [56]. Neuromarketing and eye tracking tools allow market researchers to reveal the unconscious reactions of consumers to the visual aspects of products, but at the same time, ethical issues have to be considered [57].

Scientists have learned more in recent years than has been discovered in human history, and considerable and essential advances have been made in science and technology. Together, these advances offer the possibility of a better and deeper understanding of both the causes and pathophysiology of complex diseases and consumer behavior [58]. Therefore, a better understanding of human biology is a vital necessity and could provide a promising strategy for preventing and treating some diseases, to serve the needs and demands of human beings and to explain their behavior. The following descriptions briefly describes how the brain is anatomically structured and how scientists are reviewing its activity, taking into consideration the predominant characteristics of human behavior. Due to new advances in neuroimaging techniques in recent years, neuroscientists are discovering more and more about how surprising the human brain is. Providing the right stimulation, the human brain can easily accomplish seemingly miraculous functions [59,60]. The brain has become the core of neuromarketing research both in the medical and socioeconomic fields. Neuromarketing research is carried out in order to understand consumer behavior and to support consumers in fulfilling their conscious or unconscious reactions [61].

The brain is the main element in neuromarketing research. Neuromarketing is a quite recent discipline that aims to identify more direct communication channels to purchase decision processes, using methodologies related to neuroscience findings [62]. It is a discipline that combines several educational branches: traditional marketing in economics, with neurology in medicine and psychology, with behavioral science. The brain's capabilities

can be activated or triggered by the right form of stimulation, being therefore important for the marketing activities of companies [63].

The part of the brain used in each activity is not the same for every person and can be influenced by whether a person is left- or right-handed. Hemispheric dominance varies from person to person and between different activities, so more research is needed for science to fully understand all the factors that affect this [64]. The human "operating system", as the brain is called, is divided into two symmetrical hemispheres, known as the left and the right brains [65]. It is widely thought that the two hemispheres are different, controlling distinct aspects of cognitive function. However, the separation between the right and left hemispheres does not dictate specific personality traits [66]. Brain imaging shows that there are asymmetries in the activity of several regions of the brain, even in times of sleep or rest. Four different dimensions of these asymmetries have been revealed, each uncorrelated with the other. One of these brain dimensions includes language control, while the other three are related to attention, internal thinking, and vision. Attention, vision, and emotion tend to be in the right hemisphere, with internal thinking and language on the left side of the brain [64,67]. Moreover, emotions are controlled by the limbic lobe, which is positioned in the middle of the brain [68].

2.3. Information Overload and the Attention of the Consumer

Another aspect that we investigated is the way the number of objects influences the reaction of participants to information overload. Today, humanity is facing a more acute information overload than decades ago, and by understanding and being aware of it, people can improve their quality of life. The constant flow of new information causes information overload or brain overload, which has become an undeniable issue for many people. It is very important to focus on the root cause of this actual growing problem, to find a viable solution by educating and helping people to filter out the information received [69]. Although the term, 'information overload', is a commonly used expression today and seems to be considered a recent addition to the vocabulary being frequently used in various publications, the phenomenon was described in the 1950s as sensation overload in the urban world [70]. In several studies, it has been observed that consumers in cities are most impacted by communication overload. In 1964, Gross used the terminology of information overload for the first time [71].

Information overload has been attributed to the amount of multitasking that people are doing in today's digital age, with mention of the human indecision to prioritize activities and tasks leading to information excess [72]. Based on the premises from different studies, information overload seems to affect the concentration of younger people. A study conducted by [69] has shown that people under the age of 30, especially, perceive information overload as a problem that distracts them from daily activities and obstructs them from finding relevant information compared to those over the age of 30. While information overload can create a lot of confusion, anxiety, and stress for individuals [73], for most individuals, having access to a lot of information has led them to feel that they have more control over their lives. The cognitive overload is triggered under certain circumstances and when in contact with state institutions [74]. Even if there are measures and tools that could be taken to improve the way people consume their information, nowadays, there is still a challenge for companies both to identify the proper ways of meeting consumers' needs and desires, under conditions of economic profitability for them, and to increase employees' productivity and innovation [69]. In our research, we investigated if information overload affects attention to celebrity-endorsed advertising.

3. Methodology and Results

3.1. Methodology of the Eye Tracking Experiments

The objective of our research was to measure the impact of celebrity endorsement on the attention of consumers in beverage advertising. Across three eye tracking studies, we demonstrate that celebrities in beverage advertising have the highest attraction by

consumers, having the fastest entry times, and the longest fixation times. In each of the three eye tracking studies, we put together two advertisements of the same product, with one containing the celebrity promoting the product and the other, a picture of the product. In the first eye tracking study, the advertising containing the product and the logo was put on the top of the page, while the advertising containing the celebrity and the logo was put at the bottom of the page. In the second study, the advertising containing the celebrity and the logo was placed on the left side of the screen, while the advertising containing the product and the logo was placed on the right side of the screen. In the third study, we tried to distract the attention of the consumer, by putting together two advertisements for the same product, containing two different celebrities. The advertising with the same male celebrity used in the previous studies was placed on the left side of the screen, while the advertising with the female celebrity was placed on the right side of the screen. Across the studies, we also manipulated the number of objects in the advertising, by having more or less objects in the image, in order to test if information overload affects the attention of the consumer. In the first two studies, the final collage contained only 3–4 objects (the celebrity, the product, and the logo once or twice), while in the third study, the collage contained 9 objects (two celebrities each holding a product, a complementary product, the logo twice, and text describing their experience twice). The explicit images used in the eye tracking experiments were not included in the paper because they contain commercial information. The participants had to watch the collage of pictures, without having further tasks.

The first eye tracking study was conducted with the help of an eye tracking tool on 24 participants between the ages of 19 and 25 years. Each participant had watched the collage of advertising for 10 s. The second and third studies were performed with the help of a Gazepoint Eye Tracking Device on the same 19 participants between the ages of 19 and 25 years. Each participant watched each collage for 8 s. It must be noted that our eye tracking devices do not allow measurements on a large number of participants. For all studies, the aforementioned number of participants refers to the valid measurements, after eliminating the cases wherein there was no eye activity recoded for the defined areas of interest.

In order to measure the gaze reaction of the participants, we manipulated the objects in the three eye tracking experiments. As mentioned earlier, in the first two experiments we compared only a celebrity with a product, by changing the position of the two elements, while in the third experiment, we included a distractor, by adding a second advertisement for the same product, with a celebrity. For each of the eye tracking studies, the areas of interest (AOI) were defined, and the total fixation entry times were calculated. 'Total fixation time' refers to the time the eye's gaze was focused on the defined area of interest. The 'entry time' refers to the time when the participant first watched the area of interest and was measured in milliseconds (ms). The results are presented as follows.

3.2. Results of the Eye Tracking Studies

The data obtained with the help of the eye tracking devices were analyzed by using descriptive statistics and discriminant analysis in SPSS 20.0. For the interpretation, the areas of interest that were not watched by the participants were quantified with 0.0 as the total viewing time and with 8 or 9 as the entry times, which are the equivalent of the total watching time.

In the first study, the participants watched the celebrity first (average entry time after 1.2 s after display) and watched them for the longest time (average fixation of 2.5 s). The second most-watched object was the logo (average entry time after 1.3 s after display), but it was watched for the shortest time (average fixation of 1.1 s). The product was watched last (average entry time after 2.6 s after display) and it was watched for an average of 1.8 s. The high values for the standard deviations show that there were large differences from one participant to the other. The descriptive results for Eye Tracking Study 1 can be observed in Table 1.

Table 1. Descriptive results of Eye Tracking Study 1.

Indicator	Item in Advertising	Mean (ms)	SD	% Time Spent on Item	Hit Ratio
Total fixation time	Celebrity	2520.6	1544.1	46.5%	100%
	Product	1801.1	1359.8	33.2%	95.8%
	Logo	1093.0	976.6	20.1%	91.6%
Entry time	Celebrity	1221.3	2068.4		
	Product	2604.7	2092.6		
	Logo	1315.6	2452.9		

These results were consistent among participants as can be seen in Table 2. The discriminant comparison between the viewing times of the celebrity and the product shows acceptable significant values for both the total fixation time ($F = 2.93$, $p = 0.093$) and the entry times ($F = 5.30$, $p = 0.026$). The discriminant model between the celebrity and the product also has an acceptable significance, with a Chi-square value of 6.152 and $p = 0.046$. The comparison between the celebrity and the logo shows significant results only for the total fixation ($F = 14.65$, $p = 0.000$), but not for the entry times ($F = 0.021$, $p = 0.886$). Watching the logo was not necessarily associated with watching the celebrity. Some participants watched both, while others did not, which led to an inconclusive result. In spite of these results, the discriminant model between the celebrity and logo is significant, with a Chi-square value of 13.486 and $p = 0.001$.

Table 2. Discriminant analysis for the viewing pattern of objects in Eye Tracking Study 1.

Discriminant Comparison	Indicator	F	Wilks' λ	*p*
Celebrity vs. Product	Total fixation	2.93	0.940	0.093
	Entry time	5.30	0.897	0.026
Celebrity vs. Logo	Total Fixation	14.65	0.758	0.000
	Entry time	0.021	1.000	0.886

The second study shows similar results. In eye tracking study 2, the celebrity was again the first watched object in the advertisement (average entry time of 2.1 s after display), but it was not the longest watched object (average fixation of 1.3 s). The product was watched for the longest time (average fixation of 2.0 s), although it was watched the latest (average entry time of 4.9 s after display). The logo displayed in the advertising of the celebrity was watched later (average entry time of 2.3 s after display) in comparison to the logo displayed in the product advertising (average entry time 2.7 s after display), but it was watched for a longer time (average fixation of 0.7 s for Logo 1 in comparison to the average fixation of 0.2 s for logo 2). All these results are presented in Table 3.

Table 3. Descriptive results of Eye Tracking Study 2.

Indicator	Item in Advertising	Mean (ms)	SD	% Time Spent on Item	Hit Ratio
Total fixation time	Celebrity	1332.6	639.9	16.67%	100%
	Logo 1	760.5	719.9	9.51%	78.9%
	Logo 2	253.7	253.3	3.18%	84.2%
	Product	2074.2	1743.6	25.93%	94.7%
Entry time	Celebrity	2120.0	2872.8		
	Logo 1	2752.6	2911.5		
	Logo 2	2585.8	2770.8		
	Product	4968.9	3142.7		

The discriminant comparison between the viewing times of objects shows similar results as in study 1. The comparison between the viewing times between the celebrity

and product shows acceptable results for both the total fixation (F = 3.02, $p = 0.090$) and the entry times (F = 8.50, $p = 0.006$). The overall discriminant model is also significant, with a Chi-square value of 10.736 and $p = 0.005$. For the comparison of the viewing times between the celebrity and the logo, there are significant results only for the total fixation in both cases (F = 6.70, $p = 0.014$ for Logo 1 displayed in the celebrity advertising and F = 46.68, $p = 0.000$ for Logo 2 displayed in the product advertising). There are no significant results for the entry times either for Logo 1 (F = 0.45, $p = 0.505$) or for Logo 2 (F = 0.25, $p = 0.614$). Both discriminant models are significant, with Chi-square values of 6.034 and $p = 0.049$ (for the comparison between the celebrity and logo 1), and 30.076 and $p = 0.000$ (for the comparison between celebrity and logo 2), respectively. This result is consistent with Study 1 and can be explained by the fact that there was no clear viewing reaction from watching the logo in comparison to the celebrity (Table 4).

Table 4. Discriminant analysis for the viewing pattern of objects in Eye Tracking Study 2.

Discriminant Comparison	Indicator	F	Wilks' λ	*p*
Celebrity vs. Logo 1	Total fixation	6.70	0.843	0.014
	Entry time	0.45	0.988	0.505
Celebrity vs. Logo 2	Total fixation	46.68	0.435	0.000
	Entry time	0.25	0.993	0.614
Celebrity vs. Product	Total fixation	3.02	0.922	0.090
	Entry time	8.50	0.809	0.006

Study 3 was the most complex, having a higher number of objects in comparison to the previous two studies. This study comprised two advertisements of the same product, both having a celebrity. With this comparison, we intended to analyze if the first celebrity endorsing the product had a higher impact on the attention of the consumer in comparison to a newly introduced celebrity. The results show that, indeed, the celebrity endorsing the product from the beginning of the campaign had a higher impact than the newly introduced celebrity for both the total fixation (1.02 s) and entry times (2.1 s after display). The newly introduced celebrity was the second-most attractive element in the advertisement, having an entry time of 2.78 s after display and a total fixation time of 1.59 s. The text, the logo, and the product included in the two advertisements were watched later after display and for shorter times. The least attractive element was the product displayed in the advertisement with the newly introduced celebrity. It was watched for only 0.04 s (26.3% hit ratio) and the entry time was 6.8 s after display.

Analyzing the discriminant comparison between the elements in the advertising, it can be observed that the celebrity endorsing the product for a longer time was definitely more attractive in comparison to all elements for both the fixation and entry times, with the exception of the newly introduced celebrity. The first celebrity had a significantly better entry time than the newly introduced celebrity (F = 4.27, $p = 0.046$), but there was no clear significant distinction for the total fixation time (F = 2.30, $p = 0.137$). The discriminant model between the first and second celebrities is significant, with a Wilks' lambda of 0.861, Chi-square value of 5.231 and $p = 0.073$ (Tables 5 and 6).

Table 5. Descriptive results of Eye Tracking Study 3.

Indicator	Item in Advertising	Mean (ms)	SD	% Time Spent on Item	Hit Ratio
Total fixation time	Celebrity	2126.8	1099.2	26.57%	94.7%
	Text 1	476.3	427.6	5.95%	84.2%
	Logo 1	166.8	196.9	2.09%	57.8%
	Product 1	235.3	253.4	2.93%	57.8%
	Celebrity 2	1591.6	1072.2	19.89%	89.4%
	Extra product 2	362.6	319.0	4.52%	78.9%
	Text 2	327.9	291.0	4.09%	84.2%
	Logo 2	202.1	286.4	2.52%	57.8%
	Product 2	42.6	92.6	0.53%	26.3%
Entry time	Celebrity	1020.5	1771.0		
	Text 1	2487.7	2779.3		
	Logo 1	5522.6	2574.7		
	Product 1	5031.6	2472.5		
	Celebrity 2	2783.7	3270.1		
	Extra product 2	4411.6	2777.6		
	Text 2	4802.6	2401.7		
	Logo 2	5739.5	2362.7		
	Product 2	6830.5	2532.0		

Table 6. Discriminant analysis for the viewing pattern of objects in Eye Tracking Study 3.

Discriminant Comparison	Indicator	F	Wilks' λ	*p*
Celebrity vs. Text 1	Total Fixation	37.20	0.492	0.000
	Entry time	3.76	0.905	0.060
Celebrity vs. Logo 1	Total Fixation	58.52	0.381	0.000
	Entry time	39.43	0.477	0.000
Celebrity vs. Product 1	Total Fixation	53.41	0.403	0.000
	Entry time	33.04	0.521	0.000
Celebrity vs. Celebrity 2	Total Fixation	2.30	0.940	0.137
	Entry time	4.27	0.894	0.046
Celebrity vs. Extra product 2	Total Fixation	45.13	0.444	0.000
	Entry time	20.13	0.641	0.000
Celebrity vs. Text 2	Total Fixation	47.55	0.431	0.000
	Entry time	30.52	0.541	0.000
Celebrity vs. Logo 2	Total Fixation	54.54	0.398	0.000
	Entry time	48.52	0.426	0.000
Celebrity vs. Product 2	Total Fixation	67.81	0.347	0.000
	Entry time	67.17	0.349	0.000

3.3. Results of Information Overload in Advertising Endorsed by Celebrities

We also analyzed the impact of the number of objects presented in the collage of advertising as it might have had an impact on the attention of the user. The results show that the total fixation time of the celebrity is highest for the study with the fewest number of objects, followed by the image with the highest number of objects. It is clear, that for the situation with a low number of objects, the consumer focused on the celebrity (to the detriment of the product and logo). For the image with a high number of objects, the consumer focused again on the celebrity, perhaps in order to avoid the information overload provided by the large number of objects. In the image with an average number of objects, the attention towards the celebrity is lower and, at the same time, the product is watched for a longer time. In terms of the entry times, the celebrity was watched first,

being the most attractive element in the image, while in the case of a higher number of objects, the logo and the product were watched later in the sequence of images (Figure 1).

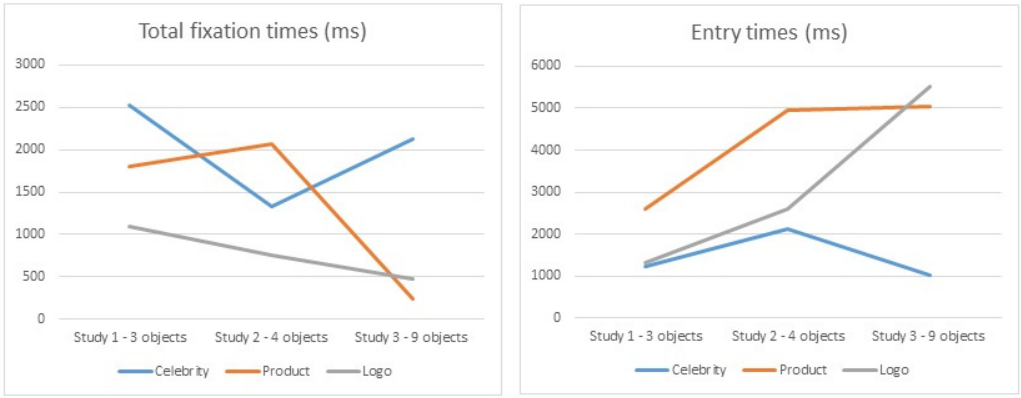

Figure 1. Comparison among the eye tracking studies based on the number of objects.

4. Discussion

The results of our eye tracking studies confirm the fact that the celebrity is the most attractive element in the advertising, being watched for the longest time and as among the first element in the image. Moreover, in the study with two celebrities, both celebrities were watched for the longest time and as among the first elements in the image. It must also be mentioned that the position and size of the elements in the advertising might have affected the results. Consumers have a tendency to watch the objects positioned at the top of an image and on the right side first (as they read information from right to left). In the first eye tracking experiment, the picture with the celebrity was positioned at the bottom of the image, so it was not influenced by previous patterns. In the second and third experiments, the celebrity was positioned on the right side of the screen, which might have posed an advantage to the gaze pattern. Regarding size, in the first and second experiments, the sizes of the picture with the celebrity were about the same so it probably did not influence the gaze of the viewers. The logo of the advertised product was smaller, but this frequently happens in advertising prints. In spite of these potential influences, the results highlight the effect celebrities have on the attention of the consumer. In our advertising, besides watching the celebrity, the participants also watched the product and the logo, confirming the good design of the advertising. It must also be said that, for our experiments, we have used a familiar advertising campaign.

As indicated by the results, the number of objects in the advertising also impacted the attention of the viewer. Our results show that in the case of an average number of products, the respondents watched the product or the logo for the longest time. In the case of a small number of objects, it is apparent that the viewer watched the elements in the advertising for longer, as there were no other distractors. In this case, he or she had time to analyze both the celebrity, and the advertised product and logo. In the case of a bigger number of objects, we assume that the consumer unconsciously tried to avoid the information overload, by watching the most familiar element in the advertising, which was the celebrity. Therefore, a large number of objects in an advertisement distracts the attention of the consumer away from most of its elements (such as the product and logo), leading them to watch the most familiar element. Consequently, an average number of objects best impacts the distribution of attention towards elements in advertising endorsed by celebrities. This allows the consumer to both watch the celebrity and the advertised product.

5. Conclusions

The results of our study highlight the importance of celebrity endorsement in advertising and have important implications in the design of advertising endorsed by celebrities. The main result focuses on the celebrity as the attention-grabber in advertising and on the optimal number of objects, in order to distribute the attention of the consumer to both the

celebrity, and to the advertised product and logo. The celebrity definitely plays the role of an eye-catcher in advertising by being among the first and the longest watched element, but at the same time, an optimal number of objects allows the consumer to also watch the advertised product and logo. These results are in line with the existent literature, which shows that celebrity endorsement is efficient when advertising is well-designed [6–8], but at the same time, extend the theory by adding a neuroscientific approach to the impact of the number of objects on the attention of the consumer. Besides the match-up effect, the credibility and familiarity of the celebrity and the brand are also important in the design of advertising in terms of the number of objects.

The limitations of this study include that this is a rather exploratory study that attempts to reveal the impact celebrity-endorsed advertising has on the attention of the consumer. Both the position and size of the pictures were considered when choosing them, but further analysis is necessary in order to prove their influence. Based on these results, several components of these results should also be tested in different contexts. All three studies are based on a familiar and successful advertising campaign, so it is expected that most respondents already know the advertising. Therefore, future studies could further test the situations of familiar vs. unfamiliar contexts, and by manipulating the number, positions, and sizes of the objects in advertising endorsed by celebrities.

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